Section 1 Governance

Section Overview:

1.0 Governance

The following is a description of the Anza Borrego Desert RWMG (ABD RWMG) governance process, participating entities, including their role in the RWMG process, and their regional water management responsibilities. The formulation of the ABD RWMG will allow for a long term working relationship that can lead to a successful solution to the region's water resource management.

All stakeholders and resource agencies have been invited to participate in the RWMG process. The interests and working relationships between these entities has been identified previously and their participation has been grouped into a Policy/Steering Committee or within a Stakeholders subcommittee. Additionally, while not a formal committee, the sole local newspaper, the *Borrego Sun,* serves as an additional outreach component of the RWMG. Each committee make-up and function is described as follows:

1.1 Policy Committee

Policy/Steering Committee is composed of the three 'local agencies, two of which possess water management authorities': the Borrego Water District, the County of San Diego (County) and the Resource Conservation District of Greater San Diego County (RCD). This is the basic decision making committee. Input from the Stakeholder's subcommittee is presented, with recommendations to this committee. This committee has the responsibility of providing funding for the activities of the RWMG.

1.1.1The Borrego Water District: The Borrego Water District (BWD) was established in 1962 as a California water district. The District provides water, sewer, and flood control and gnat abatement for areas in the unincorporated community of Borrego Springs. Additionally, the District adopted a groundwater management plan under Assembly Bill 3030 in 2002 and obtained the authority of a groundwater replenishment district. This designation allows the BWD to do planning for groundwater management and provides the authority, among others, to (a) buy and sell water, (b) exchange water (c) distribute water in exchange for ceasing or reducing groundwater extraction (d) recharge the basin and (e) build necessary works to achieve groundwater replenishment. This also provides the authority to levy a replenishment assessment, but only if replenishment water is available. The BWD is not a member of the San Diego County Water Authority (CWA), the regional member of the Metropolitan Water District of Southern California that imports supplemental water into San Diego County.

As indicated, the BWD is the sole domestic water supplier, with the exception of a few private domestic wells, in the Borrego Valley area and also the AB 3030 Groundwater Management agency for the Borrego Valley Groundwater Basin. The BWD has limited flood control management as well as water supply management authorities.

1.1.2 The County of San Diego (County): The County is charged with providing flood protection throughout the unincorporated areas of the county. However, the BWD has responsibilities for flood control in its Improvement District #1.

The County has many authorities, including flood management for the Borrego Valley area. The County has regulatory control over land uses. Developers and landowners must obtain permits from the Department of Planning and Land Use (DPLU) to develop or modify land in the Borrego Valley.

1.1.3 The Resource Conservation District of Greater San Diego County (RCD): The RCD is an independent, non-enterprise (local government) special district organized under Division 9 of the California Public Resources Code. It is authorized and directed to promote and provide conservation education, to conduct research, and to advise and assist other public agencies and private individuals in the areas of land-use planning, soil and water conservation, wildlife habitat enhancement and restoration, control of exotic plant species, and watershed restoration.

1.2 Stakeholders Subcommittee

This group is comprised of Agricultural Alliance for Water and Resource Education, Golf Course Association of Borrego Valley, the ABSP, the communities of Jacumba, Majestic Pines and Canebrake. Further, several local residents participate regularly in meetings. A further description of the major entities follows:

Golf Course Association of Borrego Valley (GOLF): Recreation is the second most intensive use of groundwater in the Valley. Golf courses include the De Anza Country Club, the Borrego Springs Resort, the Montesoro Golf and Social Club, the Springs at Borrego Resort, the Road Runner Country Club and the Club Circle Golf Course. Recently, the golf courses formed a nonprofit organization to provide representation for their interests. Jerry

The Sponsor Group (Spon): The Borrego Springs Sponsor Group is a County of San Diego sanctioned entity that provides local input to the county planning process. Members are appointed by the Board of Supervisors through nominations from the local group. The members have no term limits or official power over planning matters. They are an advisory panel that makes recommendations to the San Diego County Department of Planning and Land Use.

Agricultural Alliance for Water and Resource Education (AAWARE): This California nonprofit mutual benefit corporation was formed in 2003 by the majority of growers in the Borrego Valley. Its' purpose is 'to provide educational information concerning agricultural use of water resources and to protect against the reduction of that use without just compensation…' This entity has been active in helping to define the amount of water used by agriculture and has conducted a seminar on methods to reduce water usage in the Valley.

Anza-Borrego Desert State Park (ABSP): Anza-Borrego Desert State Park is the largest state park in California. Five-hundred miles of dirt roads, 12 wilderness areas and miles of hiking trails provide visitors with an opportunity to experience the California Desert. The 600,000 acre

(2,400 km^2) park is named after Spanish explorer Juan Bautista de Anza and the Spanish name borrego, or bighorn sheep. The park features washes, wildflowers, palm groves, cacti and sweeping vistas and fauna including roadrunners, golden eagles, kit foxes, mule deer and bighorn sheep as well as iguanas, chuckwallas and the red diamond rattlesnake.

Canebrake CSD: This district proves potable water service to a portion of the unincorporated community of Canebrake located about 40 miles southeast of Julian and is bordered on three sides by the ABD State Park and by federally owned land on the remaining side. The supply system consists of one well, two storage tanks and distribution pipelines. A report prepared for the district indicated that a back up well, additional storage and replacement of the leaking distribution pipelines are needed. The district supplies water to about 70 connections.

Majestic Pines CSD: The Majestic Pines service area includes approximately 1,019 acres and serves an estimated population of 1,964 with 630 connections. Their water and waste water needs of the community are being met through the US Department of Agriculture. (Email, SDLAFCO, 2010)

Jacumba CSD: This district supplies water to the community of Jacumba, located about directly east of San Diego and just north of the border with Mexico. The community has been granted Colonia status and as such is able to access both State and Federal funding. Therefore, the community declined to participate in this IRWM process. The District is pursuing an avenue to apply for and obtain funding under the Colonia status to assist in acquiring federal and state financial assistance. The present infrastructure is limiting their efforts of providing potable water to the residents and customers within the district. .

The Jacumba CSD service area includes approximately 430 acres and serves an estimated population of 392. The CSD's park and recreation services power was activated by LAFCO in 1985 to allow the CSD to organize and conduct a community recreation program and to construct and operate a community/senior building. The phone number for the Jacumba CSD is. (Email, SDLAFCO, 2010)

Anza Borrego Desert State Park Foundation: Anza-Borrego Foundation (ABF) is a nonprofit cooperating association for Anza-Borrego Desert State Park. Its mission is to acquire land for conservation in and around the Park, educate the public on its resources, and support research relevant to our region.

ABF operates Anza-Borrego Institute, a field school which provides educational courses to visitors. (Web)

Bureau of Land Management

Indian Reservations: Representatives of the four tribal organizations were invited to participate in the Stakeholders Committee. They declined to formally participate, but some provided information on their resources and concerns, as indicated below.

Los Coyotes: No information

Manzanita: No information

Campo: No information

Cuyapaipe (Ewiiaapaayp Band)

The Cuyapaipe Indian Reservation consists of two non-contiguous parcels. The largest parcel consists of 5,454 acres and is located in the Laguna Mountains. This part of the Reservation is approximately 60 highway miles from San Diego. The Little Cuyapaipe Reservation consists of about 10 acres and is located about 35 highway miles from San Diego. Population on the reservation is approximately 9.

Three flowing springs have been identified on the Reservation. Ground water from two wells is currently the source of all drinking water. There are an estimated nine acres of designated wetlands occurring on the main Reservation.

Ocotillo Wells State Off Road Vehicular Recreation Area: Adjacent to Anza-Borrego Desert State Park, this 80,000 acre area off-road exploration and recreation has desert terrain, from below sea level to 400 foot elevations. It is a motorcycle, four-wheel drive, all-terrain vehicle, and dune buggy use area. Outside the boundaries, to the south and east, large tracts of BLM land are also open to off-highway vehicles. Internet

California State Fish and Game

1.3 Non Local Technical Resources

Two other agencies, though not part of the governance structure of the RWMG nor are they local stakeholders, serve as technical resources to the RWMG. The USGS and DWR are actively working in the Borrego Valley area and provide technical advice and information.

California Department of Water Resources, Southern District (DWR): The DWR has been conducting limited assessment of the groundwater resources since about 2002 through the DWR Local Assistance Program. In 2008, the DWR and BWD entered into a contract that could span a three year period to perform a comprehensive well inventory and water quality assessment of the basin.

United States Geological Survey (USGS): The USGS has entered into a contract with BWD to develop a numeric model of the groundwater basin. This is three year effort also includes establishing a high precision GPS survey of key wells in the Valley.

1.4 Public Process to Identify Stakeholders and Their Inclusion in the Planning and Decision Process

As indicated above, the IRWM process was initiated by a public meeting. Prior to that, a notification of the meeting was published in the local newspaper, the Borrego Sun. Invitations by direct telephone calls were made to the three water supply communities located in the central and southern areas of the Region. Telephone invitations were also made to the tribal councils that owned land within the Region. Also contacted were all of the known non-profits, NGOs and governmental agencies that were known to have an interest in water management.

Follow up invitation letters were also sent to all those contacted. The letters and newspaper announcement described the IRWM process and its purpose. The BWD website was modified to include a link to the IRWM process.

It was initially envisioned that several stakeholder committees (Stakeholders, Technical and Public Information Dissemination) would be established, but due to the relatively small attendance at the first meeting, those stakeholders agreed that a single Stakeholder committee would suffice. The Stakeholder committee agreed to meet monthly until the Plan was completed.

The role of the Stakeholder committee was discussed and established as the decision group in formulating and construction the IRWM Plan. This would include the establishment of goals and objectives of the Plan and the incorporation and analysis of projects that would be included in the Plan.

Attendance at the meetings has usually included the BWD, Canebrake CSD, the growers, the ABD Foundation, the ABD State Park, the RCAC, San Diego Flood Control District, the Golf Course Association of Borrego Valley, the Bureau of Land Mangement, 3-4 local residents and the Borrego Sun newspaper. Minutes were prepared by a recording secretary and distributed by email to the participants and posted on the BWD website.

Stakeholder participation has always been somewhat less than desired, however, it is believed that attendance has been good considering that two of the four water supply agencies decided not to participate, the small population residing in the Region and the remoteness of the two remaining water supply participating agencies.

1.5 Identification of DAC and their Inclusion in the Process

A review of the 2000 Census (factfinder) showed that the Borrego Valley's Median Household Income is less than 80% of the State wide average. Since the 2000 census does not provide a geographic breakdown of areas within the census tract, it was not possible to identify a specific area of the Borrego Springs community as 'disadvantaged'.

2000 Census data was also queried for the Canebrake CSD. The Median Household Income for the blocks comprising this water agency showed a 2000 census MHI greater than 80% of the State wide average. Since the other two water agencies declined to participate in the IRWM process, their MHI was not determined.

Since the entire community of Borrego Springs is considered disadvantaged, and the public members of that community, local NGOs and non-profits were participants in the Stakeholders Committee, the Borrego Valley DAC was engaged. To further engage the community, the agendas and the results of all Stakeholder meetings were published in the Borrego Sun as well as shown on the BWD website. Thus, residents of the Borrego Valley DAC were kept informed of the process.

Section 2 Description of Region

Section Overview: This section describes the land ownership, drinking water systems, and current and future water use in the region as well as major watersheds, streams and springs and their potential for impact from climate change. Additionally, the section identifies facilitates for wastewater and storm water management and agencies that control growth and water quality of the region. Finally, the issues and conflicts are identified and discussed.

2.0 Location

The Anza Borrego Desert Region is located in the Lower Colorado River Hydrologic unit. The region is almost entirely in the County of San Diego, with a small area in southern Riverside County. The region is bounded on the east by Imperial County; on the south by Mexico; on the west by the Peninsular Range and on the north by Riverside County, except for that portion of the Coyote Creek watershed that extends into the county.

2.1 Land Ownership in the Region

The Anza Borrego State Park occupies about 70% of the region. *Percentages needed*

Land Use/ownership
Forest Lands
BLM
Private Lands
Other

2.2 Drinking Water Systems

The communities within the region and the water systems are listed below in Table 2-1. Also included in the table is a description of water supplies, current and future water demands (for a minimum 20-year planning horizon). Service areas are shown on Figure 2-1.

Table 2-1 Water Supply Communities in the ABD Region

Community/Entity	Public Health Regulatory Agency (a)	Number of Connections	Water Supply Source	Current Water Use (afy)	Future Water Use (20 years) (afy)
Borrego Springs Water District	CDPH	2016	Groundwater - Overdraft	1,900	3,000 (b)
Canebrake Co WD	SDC		Groundwater - Bedrock	4	
Majestic Pines	SDC	630	Groundwater - Bedrock		
Jacumba CSD	CDPH	221or 184?	Groundwater - Bedrock		
Banner Grade Store Transient System	SDC				
ABD State Park Horse Camp Palm Canyon Tamarisk Grove	CDPH	 1 16 1			
Indian Reservations: • Los Coyotes • Manzanita • Campo • Cuyapaipe	CDPH		Groundwater - Bedrock		
Small Communities on Individual Wells: • Ocotillo Wells • Shelter Valley	NA				

(a) SDC - San Diego County DEH and CDPH - California DPH
(b) No increase in net water use due BWD and County mitigation programs. (See Chapter X for explanation of mitigation policy.) Borrego Community Plan may be helpful.

2.3 Other Water Use: The major developed water uses in the region are for agricultural, landscape and recreation. These uses are located in the Borrego Valley. Current water uses by these categories are:

Use	Amount (afy)
Agriculture	16,600
Landscape	840
Recreation (Golf Course)	4,400

2.4 Major Watersheds/Streams/Springs

Watersheds/Streams: Major hydrologic units in the region are broadly defined by the Board as the Clark and Anza Borrego Hydrologic Units (HU). The Clark HU drains into the Clark Lake Dry Lake.

The Anza Borrego HU is defined by four hydrologic areas:

- Borrego HA which includes Coyote and Palm Canyon Creeks.
- San Filipe HA: San Filipe Creek is the major drainage conveyance.
- Aqua Caliente HA: The HA includes Carrizo, Vallecito and Canbrake Creeks.
- Jacumbra HA: Includes the McCain and Jacumbra Creeks.

All drainage from the above HAs that does not percolate into the valley floor flows into the Salton Sea.

The Colorado River Basin Plan lists the following surface water systems in the region:

Borrego Palm Canyon Creek
Boundary Creek
Brown Creek
Carrizo Creek
Chino Canyon Creek
Coyote Creek
Crystal Creek
Dutch Creek
Falls Creek
Grapevine Canyon Creek
Hathaway Creek
Little Morongo Creek
Millard Canyon Creek
Mission Creek
Palm Canyon Creek
Pipes Canyon Creek
Potrero Creek
Salt Creek
San Felipe Creek
San Gorgonio River
Snow Creek
Tahquitz Creek
Thousand Palms Canyon Creek
Tubb Canyon Creek
Tule Creek
Twin Pines Creek
Vallecito Creek
Walker Creek
Whitewater River
Willow Creek
Unlisted Perennial and Intermittent Streams
Washes (Ephemeral Streams)

Springs: The Board has identified a number of springs in the Region. The Board has also identified the beneficial uses of each stream (Basin Plan 2006). These springs are identified by name and State Well Numbering System and are shown in the following table.

Springs in the Anza-Borrego Hydrologic Unit

Local Name	State Well Number
Santa Rosa Spring	7S/5E - 28AS
CYCC #1 Spring	11S/5E - 22CS1
CYCC #2 Spring	11S/5E - 22CS2
Dubber Spur Spring	17S/8E - 29LS1X
Jacumba Spring	18S/8E - 7JS
Palm Spring	14S/7E - 25PS
Agua Caliente Spring	14S/7E - 18PS
Mountain Home Spring	7S/5E - 29HS
Chimney Spring	11S/5E - 15NS1
Jim Spring	11S/5E - 16LS1
Pena Spring	11S/5E - 10NS1
Carizzo Creek Spring	17S/8E - 29NS
Arsenic Spring	17S/8E - 32FS
Cotttonwood Spring	11S/5E - 21HS1
Johnnie Spring	11S/5E - 15MS3
By Jim Spring	11S/5E - 16MS1
Kane Spring	12S/11E - 21MS
Bankhead Spring	17S/7E - 34JS
Lews Spring	11S/5E - 15MS4
Rusty Spring	11S/5E - 15MS2
Parali Spring	11S/5E - 16CS1
Mountain Palm Spring	15S/7E - 13PS
Sacatone Spring	17S/7E - 2QS

Additionally, the Park has also identified the springs in the area and these are displayed on Figure.

2.5 Wastewater Facilities: Domestic and commercial sewage is disposed of though septic tank and leach fields or pits throughout the region, except in some locations in Borrego Springs area. These include the Montesoro development, The Club Circle development, the Borrego Springs Resort and the downtown commercial area. All of these wastewaters are sewered to small activated sludge facilities and disposed of through evaporation and groundwater recharge.

2.6 Flood Control Responsibilities: The San Diego County Flood Control District is responsible for flood control in the entire region, with the exception of a small area in the Borrego Valley, known as the Improvement District No. 1 of the Borrego Water District.

2.7 Land Use Regulatory Agencies: As indicated, the region is comprised mainly of federal and state lands; the lands within the State Park and the State Recreational Area are under the jurisdiction of the State Parks Commission. Forest Service land uses are regulated by the US Forest Service. The Bureau of Land Management manages the land uses for lands under their control and Indian Tribal land uses are jointly managed by the individual tribes and the Bureau of Indian Affairs.

The remaining privately held lands are regulated by the County of San Diego, Department of Planning and Land Use as there are no incorporated municipalities in the region.

2.8 Ecological Process and Environmental Resources *water demands to support environmental needs*

2.9 Climate Change: The State Climatologist has described three significant impacts from the changing climate:

- Less mountain block recharge from snowpack expected with possible implications for long-term support of regional aquifers.
- Annual runoff concentrated more in winter months with more variability and greater extremes.
- Ecosystem challenges increased due to exacerbation of existing threats from above changes.

Further, a recent report (July, 2008) prepared by the California Department of Water Resources, entitled Water & Border Area Climate Change, summarized the impacts of climate change along the Colorado River. The impacts of climate change in the Region are shown in that report and show a 10-20% decrease in annual runoff is predicted for the period 2041-2060, with over 90% of the models in agreement.

The conclusions by the State Climatologist are in line with the model predictions. A 10-20% in local supplies to the Borrego Basin would make the imbalance even more critical. It would shorten the useful life of the aquifer.

Other areas in the Region such as Canebrake rely on recharge to the fractured mountain block complex. Recharge of these regional aquifers is normally difficult and would become more difficult with reduced runoff in the mountains. Also, with the runoff becoming more variable and extreme in magnitude, opportunities for recharging these aquifers would lessen.

It is therefore necessary to conserve what little water supply exists in the Region. This means that water conservation programs and projects, both urban and agricultural water use efficiency, should be encouraged and become the highest in priorities. Increasing local supplies, where possible, through the construction of recharge basins would help to capture the limited native supply coming from the local tributaries.

2.10 Water Quality: The water quality extracted and delivered to the customers in the Region is good. TDS and Nitrate concentrations in the Borrego aquifer meet primary drinking water standards. Some concerns are that poorer quality groundwater might migrate into the domestic wells. This has occurred on one occasion in the past.

Water delivered by the Canebrake CWD also meets all primary drinking water standards.

There are no known contamination sites in the Region.

2.11 Social and cultural makeup of the regional community.

The following table shows some characteristics about the water supply communities in the Region. It was not possible to obtain specific information about Canebrake and Majestic Pines. Further, Jacumba and Majestic Pines declined to participate in the IRWM process.

Communities	Borrego Springs	Canebrake	Jacumba	Majestic Pines
Tot Population	2856		695	
Median Age	49.3		41.8	
White	2307		470	
Black	25		25	
American Indian	22		31	
Asian	8		1	
Hispanic	956		237	
MHI	35,648		25,568	
Fam < Poverty	84		27	

The Borrego Springs community appears to be the only DAC in the Region. Reliable information, but undocumented, indicates that the Canebrake community's MHI is higher than that threshold to qualify for a DAC.

The above table, incomplete as it is, does provide a snap shot of the social and cultural make up of the Region. Conclusions that are drawn about the Region:

- Relatively low MHI
- Significant population of Hispanics

As will be presented later in the Plan, little or no growth is expected in the two communities that are a part of this process. The Borrego area is limited by water supply and the Canebrake area is surrounded by federal and state lands.

The benefits of the IRWM Plan being prepared are discussed in some detain the Section 6 of this Plan.

2.12 Tribal government: Four tribal entities own land within the Region. It is believed that little or no water use takes place on these lands. The entities were contacted on numerous occasions to participate in the Stakeholders meeting. However, they declined to participate in

the process. However, the Ewiiaapaayp Band of Indians did provide a report on their water supplies.

2.13 Issues and Conflicts for the Region

The region is comprised of the State's largest State Park, a State Vehicular Recreational area, several tribal holdings, Bureau of Land Management lands, one relatively large community of approximately 3,000 residents and three small communities (Canebrake, Majestic Pines and Jacumba). The County of San Diego has responsibility for zoning and flood control. Each entity's issues will be discussed separately as the issues and conflicts are somewhat different for each of the entities.

Water supply to the region is composed of runoff from the surrounding mountain watersheds. These flows recharge the Borrego Valley aquifer and the fractured mountain basin complex along water courses. Water is extracted from numerous wells. Most of the extractions are not measured and are therefore estimated water use is estimated by indirect methods. Water districts and CSDs measure their extractions.

The most important and significant water supply in the Region is the Borrego Valley Groundwater Basin. This basin has been known to be in a state of overdraft for many years (probably since 1945), but more recently, with the advent of residential growth and golf course development, the overdraft rate has increased. In the 1980s several agencies, both federal and state conducted investigations that defined the overdraft rate and the water use by domestic and agricultural segments.

2.13.1Anza Borrego State Park Issues

The Park comprises approximately 70% of the ABD IRWM Region. Water resources issues and conflicts are described in the General Plan for the Park and are excerpted below.

Surface Waters: The Park extracts groundwater or stream underflow for a supply to several campgrounds. These include Horse Camp, Borrego Palm Canyon, Tamarisk Grove and Bow Willow Campground. The upgrading of these facilities is an important issue.

Further, water rights could become an issue for the Park. Areas to the north, west, and south of the Park could contain diversions that impact surface and subsurface flow within ABDSP. As of 1998, there were 13 applications for the appropriation of unappropriated water and 26 statements of diversion and use, which were located and identified as being within watersheds tributary to Parklands. Total recorded diversions upstream from the Park in acre-feet per annum were 317 in San Felipe Creek, 1,718 in Vallecito Creek, and 644 Carrizo Creek. There are also permits for the diversion of 4,423 AFA, diverted just south of the Ocotillo Flat area on Coyote Creek, a diversion point within the Park. In total, two applications and four statements have points of diversion within ABDSP. These points are generally located in lower Coyote Canyon, Hellhole Canyon, and Tubb Canyon. Further review of the watersheds lying west and south of the Park's boundary revealed that seven reservoirs are within the Tule Creek and upper Carrizo watersheds, and a pond-like structure exists in the Cuyamaca Quadrangle.

The morphology of the majority of these reservoirs indicates that they are on-stream reservoirs formed by the creation of a dam. The Division of Water Right files do not indicate diversion rights to these reservoirs, and therefore, no diversion data has been located. Upper Tule Creek drains the McCain Valley area, and upper Carrizo Creek drains the Jacumba Valley area. Both of these areas contain private land holdings where farming and ranching operations exist.

There could be many unreported direct diversions in these areas which can only be substantiated by directly observing the diversion facilities, contacting land owners, or in the case

of the reservoirs, requesting that the Division of Water Rights investigate the apparent diversions.

Groundwater: The Borrego Valley Groundwater Basin is surrounded by Park lands. Thus, groundwater conditions affect the adjacent Park lands. Consequently, the Park has expressed its concern about declining groundwater levels.

In a letter dated January, 1998, the then Park Superintendent extensively described the impacts of declining groundwater levels on the flora and fauna of the Park. The letter describes a noticeable die-off of mesquite trees throughout the east and southeast margin of the Borrego Valley and suggests that studies be conducted to determine impacts of continued lowering of groundwater levels on the water recourses in Coyote Creek, Palm Creek Tubb Canyon, Sentenac Canyon and Grapevine Canyon. Potentially impacted floras include the California Fan Palm, Smoke tree, Desert Willow, Ironwood, Cottonwood and Willow. Areas of special interest are the Mesquite Bosque and those that have been designated by the Department of Fish and Game as 'Sensitive Habitats' and 'Significant Natural Areas'. The letter also indicates that the loss of mesquite on the valley floor will lead to increased soil loss, soil desiccation, increased surface temperature, nutrient loss and a decrease in overall biodiversity.

Regarding fauna impacts, the letter cites the potential impacts on the Federal and State listed endangered, Least Bell's Vireo. Also mentioned are the Peninsular Bighorn Sheep and numerous amphibians. A more recent issue is the proliferation of an invasive plant known as Sahara mustard (*Brassica tournefortii*). This imported plant has displaced the native wildflowers that typically appear in the early springtime. The apparent rapid expansion of this plant threatens the major tourism event in the Park.

Potential conflicts include the construction of pipelines across Park lands.

2.13.2 Borrego Valley Groundwater Basin Issues

As the area began to develop residential units, the local residents began to be concerned about the incessant lowering of the water table and that there was no plan or agency to curtail the water level drop and stop the overdraft.

With the exception of a few privately owned domestic wells, the Borrego Water District (BWD) provides nearly all of the water needs for the residential and commercial water users in the basin area. Its service area encompasses about 48 square miles, with a distribution system serving more than 3,000 customers, both residential and commercial. The district operates 11 production wells, four monitoring wells and one wastewater treatment plant.

The BWD initiated the process of becoming the AB 3030 Groundwater Management agency in the year 2000. By the year of the completion and adoption of the GWMP (2002), the stakeholders had established a number of competing interests and concerns for the future of the basin's supply.

BWD issues include the identification and acquisition of a sustainable water supply for its customers, both existing and future. A second issue is the management of the basin to stabilize water levels and possibly to restore water levels to historic beneficial levels. Finally, a third issue is the financial and economic impact on its customers of accomplishing the first two issues.

Competing stakeholders identified

The agricultural interests, who represent about 70% of the production from the basin, formed Agricultural Alliance for Water and Resources Education (AAWARE); the golf courses were identified with about 20% of the production from the basin, and in 2008 that they formed an organization to represent their interests. Finally, the residential users of the remaining 10%

are represented by the BWD. Their responsibility is to ensure domestic water supply reliability and quality. Further, the BWD is the responsible agency for managing the overdraft issue. As such, BWD adopted a Groundwater Management Plan (GWMP) in 2002. That plan was an initial effort in developing a multi-benefit integrated programs and projects to meet the regional priorities. Subsequent to 2002, the BWD continued to follow the priorities and goals set forth in that plan. Progress towards meeting the plan goals were reviewed at annual Town Hall meetings.

An Integrated Water Resources Management Plan (IWRMP) dated April of 2009, which updated and incorporated all of the planning and project development since 2002, such as new monitoring wells, was adopted by BWD, after public review and input, as an amendment to the GWMP.

The County of San Diego was also aware of the continued overdraft. Since this agency has responsibility over zoning and permitting for land use, grading and building, it began to consider and adopt ordnances dealing with grading of land for farming and controlling the expansion of water use for all new uses.

As indicated earlier, the ABSP also expressed its concern about the continued overdraft of the aquifer. Thus by about 2008, all stakeholders and their issues were identified.

2.13.3 Issues of Water Suppliers outside the Borrego Valley Area

Canebrake County Water District Issues – This district proves potable water service to a portion of the unincorporated community of Canebrake located about 40 miles southeast of Julian and is bordered on three sides by the ABD State Park and by federally owned land on the remaining side. The supply system consists of one well, two storage tanks and distribution pipelines. A report prepared for the district indicated that a back up well, additional storage and replacement of the leaking distribution pipelines are needed. The district supplies water to about 70 connections.

The district also indicates that an intermittent steam above the district has been invaded by non-native vegetation that increases the flooding potential within the community.

Jacumba CSD Issues – This small community located in the most southerly area of the region has indicated that they do not desire to participate in the IRWM process and that their water supply funding needs for upgrading their system are being met through the US Department of Agriculture.

Majestic Pines CSD Issues – Need additional storage. *No information about this community has been obtained*.

2.12.4 San Diego County Flood Control District Issues

The County's concern is the management of flood waters in region. Tropical storms have caused major damages in the past. Two damage estimates are present in the following table:

Damage Estimates ($1,000's)

Tropical Storm - Date	Borrego Valley	Jacumba	Carrizo Ck.	Canbrake Canyon	Agua Caliente	Ocotillo Dry Lake	Total
Kathleen 9/76	85	115	83	144	32	22	475
Doreen 8/77	1,644			6			1,650

More recently, flood waters from Borrego Palm Canyon in Borrego Valley caused extensive damage to the community of De Anza.

The Corps of Engineers have recently published a White Paper that presents the results of a simplified analysis of potential reductions in flood damages in Borrego Springs that may result from the implementation of a flood warning system.

2.13.5Tribal Lands Issues– *Partial information is available.*

Issues of special concern to the Ewiiaapaayp Band of Indians are: (1) to ensure potable drinking water supply and public health protection; (2) to control erosion; (3) to protect and manage sensitive habitats; (4) to enhance ground water recharge; and (5) to manage recreational uses.

2.13.6 BLM Lands Issues– No information about water issues on these lands was obtained.

2.13.7 State Vehicular Recreational Area Issues - No information about water issues on these lands was obtained.

2.14 Neighboring IRWM Efforts: Two nearby IRWM's are currently in the planning phase. The Coachella Valley IRWM is lactated immediately to the northeast and the Imperial County IRWM is situated directly and adjacent to the ABD IRWM. Representatives from the ABD IRWM regularly attend meetings of these two processes.

A third IRWM region exists immediately to the west of the ABD region. This San Diego IRWM has been in existence for some time and has prepared an IRWM plan which has been adopted by participating agencies.

Map of region: Figure 2-1 is a map of the regions showing land ownership and locations of the water purveyors.

Section 3 Goals, Objectives and Targets

Section Overview:

3.1 Plan Goals

The Policy Committee initially established the goals of the plan. After review and discussion at the Stakeholder committee, the goals were thought to address the major issues facing the region (water supply and water quality) and the processes (environmental stewardship and regional planning) through which to the goals should be accomplished. Thus, the goals were subsequently confirmed and adopted at the stakeholder level. The four goals identified and defined as follows:

3.1.1 Goal No. 1 - Improve water supply reliability

Water supply reliability is defined as having sufficiently dependable water supplies to meet the current and future beneficial needs of agriculture, residential, commercial and the environment at all times. The State of California is known for unreliable water supplies, e.g. some areas are subject to water shortages water deliveries to beneficial uses, such as in agricultural area, are curtailed. Further, shortages have resulted in water rationing in metropolitan areas.

The desert region is a particular sensitive area in meeting this goal of reliability. All areas of the AZBD Region rely on ground waters from either fractured rocks or alluvial basins. The replenishment of fracture rock water supplies depend on occasional rainfall and runoff from the surrounding areas. The Borrego groundwater aquifer has a finite life and is being depleted through overuse. Further, no pipelines that could replenish these systems currently exist. Thus, the region's water supplies are not reliable.

3.1.2 Goal No. 2 - Protect and improve water quality

Water quality is defined in the broadest sense as the summation of all of the constituents, natural or from man induced sources that render the water either useful or non-useful for the intended beneficial use without the need for water treatment.

Each beneficial use of water results in some diminishment of quality of the water. The quality of water, usually measured in terms of organic and inorganic dissolved content increases after each use. Other actives, such as gas station storage tank leakage, pose a serious threat to groundwater supplies. Maintaining and improving water quality when necessary to meet all beneficial uses is an important quality of life factor within the Region.

3.1.3 Goal No. 3 - Ensure sustainability through environmental stewardship

Sustainability is the capacity to endure. In water resources it means the maintenance of water supplies so as to sustain existing beneficial uses. The goal however, requires that the maintenance of supply be accomplished in an environmentally sensitive manner. Thus new water projects should be planned in such a way so as to protect other non-urban environmental resources.

3.1.4 Goal No. 4 - Promote integration and regional planning

Water resource planning has often been accomplished as a single purpose benefit to resolve a single local issue. Regional planning that incorporates other potential communities or having

other benefits are essential for 'smart' planning. Regional planning often brings diverse interests into project formulation and can result in establishing partnerships and cost sharing participants.

3.2 Plan Objectives and Targets

Through facilitated public workshops and Stakeholder meetings, stakeholders developed six specific IRWM Plan objectives to accomplish the four IRWM Plan goals.

Detailed descriptions of each of the objectives are presented in the following sections along with the rationale for development and inclusion of each objective. Additionally, the following table associates each objective with one or more of the identified goals.

Designation	Objective	Goals Associated
A	Reduce Water Demand	1 and 3
B	Increase Water Supply	1 and 4
C	Practice Resource Stewardship	1 and 4
D	Improve Operational Efficiency and Transfers	1,3 and 4
E	Improve Water Quality	2 and 3
F	Improve Flood Control	1,2,3 and 4

With input from the Policy and Stakeholders Committees, measurable targets for each objective have been established. The targets are presented for purposes of measuring the Region's collective attainment of the Plan objectives. The targets represent what needs to be achieved through the combined actions of the Region's governmental jurisdictions, non-government organizations, regulatory agencies, and stakeholders in order to attain the plan Objectives. While it is acknowledged that the Plan targets must evolve in response to changing conditions and stakeholder input, the targets identified herein represent a useful means of measuring progress toward achieving the Plan objectives.

3.2.1 Objective A - Reduce Water Demand

The focus of this objective is to meet the requirements of Goal 1 (Improve water supply reliability) and Goal No. 3 (Ensure sustainability through environmental stewardship).

Stakeholders rated this objective and the following objective (increase water supply) as the most import objectives and of equal ranking.

Reducing water demand or as sometimes referred to as Demand Management is a critical aspect in areas that have a limited and non renewable water supply such as the desert region. Demand reduction, if permanent, acts the same as developing a new water supply. Further, since it is accomplished on a local basis, the demand reduction is not affected by new or changing conditions or regulations from outside the area.

The primary use of water in the region for agricultural purposes in the Borrego Valley area and thus offers the greatest opportunity for reducing water demands in the region. However, the growers in that area report that they already optimize their use of water through the aid of data obtained from soil moisture sensing devices, micro spray irrigation systems and the use of evaporation/transpiration data obtained from a CIMIS station located the Valley. They

also state that groundwater pumping costs, due to the substantial pumping lift, incentivizes them to apply only the required amount of water.

Other programs, such as the recently established program by BWD to purchase a water easement over currently active agricultural lands, appear to offer an effective means of accomplishing these two goals. Stakeholders may be helpful in deciding what the future use of the 'fallowed' lands might be. If left to return to nature, the lands could be a source of sediment in windstorms. The lands could be re-vegetated with native plants, including the wildflowers for which the area is known.

Another program is the water development mitigation program of the County and BWD. This program requires that each new water use be off-set by two units of existing water use. Changing orchards to low water using trees may also be an alternative.

Golf course irrigation is a major user of water in the Valley area. Opportunities such as reducing the area of turf and allowing the turf to go 'dormant' in the summer time are under discussion.

Residential water use is relatively small compared the agricultural and golf course use, but the water use per dwelling unit is relatively high compared to other areas in the County. Programs for the replacement of toilets and washing machines with low water using models, irrigation audits and irrigation system retrofits have been implemented the Valley. Other incentive programs such as tiered water pricing, payment for turf removal, etc. have been put into operation.

3.2.2 Targets for Reducing Water Demand

The Plan targets for this objective are those included in the Governors 2009 Comprehensive Water Package; Senate Bill No. 7 on Statewide Water Conservation.

3.2.2.1 Agricultural Target: This SB 7 bill requires agricultural water suppliers to measure water deliveries and adopt a pricing structure for water customers based at least in part on quantity delivered, and, where technically and economically feasible, implement additional measures to improve efficiency. It further requires agricultural water suppliers to submit Agricultural Water Management Plans beginning December 31, 2012 and include in those plans information relating to the water efficiency measures they have undertaken and are planning to undertake.

Another target is the accumulated purchase of water easements on agricultural lands having current water demands:

- 1,000 acre feet by 2011
- 2,000 acre feet by 2013
- 3,500 acre feet by 2015

3.2.2.2 Residential Target: Regarding residential water use, the bill requires urban water suppliers to meet the per capita water use goal for their specific hydrologic region as identified by DWR and other state agencies in the 20 percent by 2020 Water Conservation Plan;

3.2.2 Objective B - Increase Water Supply

The focus of this objective is also to meet Goal No. 1 (Improve water supply reliability) and Goal No. 4 (Promote integration and regional planning).

None of the existing communities or agricultural water users is connected to a conveyance system that could import water and increase their water supplies. All depend on natural runoff of precipitation from the eastern side of the peninsular range. Precipitation falling on the floors of the valleys is readily lost to evaporation or in the case of flash flooding, is lost to runoff to the Salton Sea. Thus the entire region is dependent on rainfall, over drafted ground waters or groundwater from the fractured basement rocks. Further none of the communities in Table 2-1 expect to experience growth which would require an increase in water supply. Park water needs are also stable.

Increasing native water supply has been studied. Locally, the DWR suggested the construction of low dikes to impede the occasional runoff from the local mountains to allow for percolation into the basin, but these were readily filled by sediment. Recently, the Corps of Engineers have suggested the deepening of the De Anza flood retarding basin as a means of capturing and percolating runoff from the Borrego Palm Canyon.

There are several proposals to import water from the IID or Coachella Valley Water District. These include a range of projects: from importing only the domestic demand (present and future); projects to meet the annual overdraft and projects refill the basin.

Proposals have also been suggested to import water from local groundwater basins. A complete discussion of these options is contained in the BWD Integrated Water Resources Management Plan (March, 2009). Feasibility level studies are underway on one of the import projects. However, the acquisition of a reliable water supply that could be transported into the Valley is problematic. One importation alternative involves a conveyance system from the CVWD that would also supply water to the City of Salton Sea. Any of the importation plans would necessarily require a substantial amount of regional planning and cooperation.

In June of this year, BWD submitted a proposal to the US Bureau of Reclamation to conduct 'Basin' study aimed at identifying potential non local water supplies and assessing various importation routes into the Valley. The proposed study, Southeast California Regional Basin Study Proposal, would be a reconnaissance level study would consider reclaiming degraded perched water in the Coachella Valley as well a capturing for groundwater storage, Colorado River flows that will be lost due to the inability of Colorado water users to divert the water.

3.2.2.1 Targets for Increasing Water Supply

The Plan measureable targets to meet this objective are listed below:

- Complete hydrogeologic investigation and design in Canebrake for locating a second well by 2011.
- Complete hydrogeologic study and design of Park camp grounds needing new facilities by 2011.
- Complete hydrogeologic investigation of the Northern Clark Lake area by 2011.
- Complete feasibility (STAG Grant) studies on importing water from IID and CVWD by 2012
- If proposal is accepted for the BOR to conduct the Southeast California Regional Basin Study Proposal, pursue the study's recommendations by 2012

- Obtain sufficient new (non-Borrego Basin) water supplies to completely satisfy the residential demand of BWD by 2020.

3.2.3 Objective C – Practice Resource Stewardship

The focus of this objective is to meet the requirements of Goal 3 (ensure sustainability through environmental stewardship) and Goal No. 4 (Promote integration and regional planning).

Resource stewardship is an important component toward ensuring protection of the Region's water quality, water availability, and protection of endangered and threatened species and habitats. Resource stewardship is also important for maintaining the Region's natural aesthetics, preserving and enhancing recreational opportunities, enhancing the quality of life for residents, and providing benefits relative to tourism and the economy.

The IRWM Plan process offers the opportunity for regional cooperation and coordination by:

- allowing for the integration of water management planning actions with existing species and habitat conservation plans
- developing, implementing, and maintaining conservation plans which may include controlling invasive species
- developing and implementing a water bank in the Borrego Basin

The Region features biologically diverse and important habitats. As indicated, the Anza Borrego Desert State Park occupies approximately 70% of the region. The Park is occupied by a wide varity of plants and animals. ABDSP is world-famous for its extensive spring wildflower bloom. During years with specific meteorological conditions, a diverse array of wildflowers. A good wildflower year can draw one-third of a million more visitors to ABDSP, when compared to poor wildflower years.

Water resource management planning must be accomplished so as not to disturb or disrupt these import ecological resources. Because the Borrego Springs community is completely surrounded by the park, any importation system will have to traverse the Park and potentially impact the ecological community. Further, the significant lowering of the groundwater levels in the Borrego Basin has adversely impacted water sources on the boundary between the Park and the Basin. Restoration of historic groundwater levels would add to viability of plants and animals of the Park.

The capture and storage in the Borrego Basin of surplus Colorado River waters that are lost is a major water resources stewardship opportunity. In addition to conserving the potentially lost water, the rebuilding of the water levels in the basin has many benefits including potentially replenishing the springs and seeps along the periphery of the Borrego Basin but also by reducing the pumping lifts as it also reduces energy usage and green house gas emissions associated with the energy production.

Resource stewardship also includes the concept of utilizing the available water supplies in a sustainable manner. Thus, good demand management, such as conservation pricing, fits well with this objective.

Resource stewardship also includes Stakeholder and public involvement as a means to identify and address public interests and perceptions, ensure that the Plan and any proposed

solutions are in keeping with public interests, and provide for public ownership and support of the proposed solutions.

Stakeholder involvement may assist in identifying areas where increased public education and outreach is required and help focus on the public's key water management issues and potential solutions. Public education and outreach at community events, workshops and school-based educational programs are required to promote the identification and understanding of the Region's resources and the need for resource stewardship.

3.2.3.1 Targets to Practice Resource Stewardship.

Targets for measuring progress toward achieving objective C:

- Develop a regional IRWM website to provide centralized public access to water management data and information by 2011.
- Contact and inform landscape companies of the need for planting 'water wise' landscaping and observance of County's Landscape Ordnance.
- Develop by 2012 a regional approach to water management education.
- Conduct water management outreach at no less than 4 local and regional events each year.
- Reduce the turf area of existing golf courses by (accumulatively):
    - 10% by 2012
    - 20% by 2014
- Remove and control a minimum of 1,000 acres of non-native invasive plants by 2015. (Target includes acreage in which non-native invasive species are removed and continue to be controlled following removal.)
- Initiate a water bank in the Borrego Aquifer with a long term objective of restoring water levels to a historic beneficial level by 2025.

3.2.4 Objective D - Improve Operational Efficiency and Transfers

This objective is consistent with the Goal No. 1 (Improve water supply reliability), Goal No. 4 (Enhance sustainability through environmental stewardship) and Goal 4 (Promote integration and regional planning).

The Stakeholders committee agreed on the importance building conveyance infrastructure to provide for new water supplies in the Borrego Valley. Imported water, either from local groundwater basins or from IID or CVWD are the only means to eliminate the persistent drop in groundwater levels and potentially refill the basin to historic beneficial levels. Local groundwater basins may offer some relief, but supplies from distance sources (State Water Project, Colorado River, and Ocean Desalters) would potentially be sufficient to eventually fill the void space in the basis caused by more than 60 years of overdraft. These supplies would need to be transferred from some entity having a contract with the governing entity for these sources.

BWD has already prepared a design of a pipeline from the Clark Lake to the BWD distribution system in anticipation of favorable groundwater analysis of that area. A pipeline that extends across the basin would need to be planned and designed if the groundwater study results are favorable.

At the present time, it seems unlikely that water transfers from current contractors are available at a reasonable price. State Project Water may become available in the future when a 'fix' in the Delta is implemented. Further, all natural water supply systems are known to experience 'surplus' water years from time to time. The Region's conveyance system should be prepared to deliver water in excess of its annual need.

Currently the BWD is studying alternative water deliver options from IID and CVWD through a federal State and Tribal Assistance Grant.

Local groundwater, from Clark Lake or Allegretti Farms could serve as an interim supply until a permanent water transfer can be obtained. The conveyance of these interim supplies is being considered in the important pipeline studies currently under way.

3.2.4.1 Target to Improve Operational Efficiency and Transfers

- Complete hydrogeologic study of northern Clark Lake Basin by 2011
- Complete pipeline plan and design for extension into the northern area of the Clark Lake Basin by 2011
- Complete STAG Conveyance study by 2011
- Work with the Bureau of Reclamation, IID and CVWD to explore potential water purchase and water banking opportunities. Prepare status report by 2012.

3.2.5 Objective E - Improve Water Quality

The focus of this objective is to meet the requirements of Goal 2 (Protect and improve water quality and Goal 3 (Ensure sustainability through environmental stewardship).

The Colorado River Basin Plan lists the beneficial uses for the stream and springs in the region. These are shown in Section 2.3. The Regional Board has not established specific numeric water quality objectives for either the streams or springs. However, the Board mandates that the beneficial uses be reasonably protected. Further, the Board has not indicated that any of the beneficial uses have been impacted or degraded.

However, the Regional Board has identified three ground water basins in the Region that are in overdraft, and have indications of possible increase of mineral content of the groundwater. These include the following ground water basins, all with the Anza-Borrego Hydrologic Unit: Borrego, Terwilliger and Ocotillo. The Regional Board indicated in the 2005 plan that studies would be conducted to investigate these salinity increases.

They indicate that the establishment of numerical objectives for ground water involves complex considerations since the quality of ground water varies significantly with depth of well perforations, existing water levels, geology, hydrology and several other factors. Unavailability of adequate historical data compounds this problem. The Regional Board believes that detailed investigation of the ground water basins should be conducted before establishing specific ground water quality objectives. However, the Board is guided by the following principle:

Wherever the existing quality of water is better than the quality established herein as objectives, such existing quality shall be maintained unless otherwise provided for by the provisions of the State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California".

A further guidance policy states: *All surface and ground waters are considered to be suitable, or potentially suitable, for municipal or domestic water supply with the exception of surface and groundwater where:*

1. The total dissolved solids (TDS) exceed 3,000 mg/l (5,000 us/cm, electrical conductivity), and it is not reasonably expected by the Regional Board to supply a public water system, or

2. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Management Practices or best economically achievable treatment practices, or

3. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

3.2.5.1 Targets to Improve Water Quality

- Conduct groundwater monitoring in the Borrego, Terwilliger and Ocotillo basins by 2015
- Perform water quality assessments of each of the above basins by 2017
- Work with Regional Board to establish specific water quality objectives for each basin by 2018
- Develop a water quality improvement plan for each basin by 2020

3.2.6 Objective F - Improve Flood Control

The focus of this objective is to meet the requirements of all four goals.

Section 2.12.4 of this document outlines the severity of storm water management in the region. While flooding events are somewhat rare in the region, there exists the possibility of improving the capture of the high quality flood flows when they do occur. An example is the De Anza basin. This retarding basin was constructed on the edge of the Borrego Valley basin and provides for the capture and subsequent recharge of storm flows. Other proposed facilities such as the acquisition of the Viking Ranch offers the further benefit of capturing the 'recession' flows associated with the major storm events. Sand and gravel removed to create the basins can be sold to generate revenue.

Facilities of this nature also offer the opportunity to incorporate recreational amenities, such as trails, overlooks and wildlife sanctuaries.

Such projects improve water supply reliability, improve water quality, practice environmental stewardship and provide for regional cooperation and planning. They offer an opportunity to work with regional agencies such as the County and the COE.

3.2.6.1 Targets to Improve Flood Control

- Conduct a study of developing a combined flood control and water conservation study of the De Anza Flood Retarding Basin by 2014.
- Conduct a regional study of developing deep recharge basins near the mouth of the major stream channels in the area for capturing and recharging recession flows from storm events by 2114.

Section 4.0 Resource Management Strategies Identification and Integration

The effects of climate change on the IRWM region must factor into the consideration of RMS. RMS to be considered must include, but are not limited to, the RMS found in Volume 2 of the CWP Update 2009: Guidelines

Section Overview: Not all RMSs shown in the CWP Update 2009 are relevant to this unique Region. Thus, this Section of the Plan identifies the Resource Management Strategies that are applicable to the Region. These are then integrated or grouped according the Plan Objectives selected in Section 3. Further, the Plan Objectives are prioritized according to importance to the Region. This prioritization and integration of RMSs provides a framework for evaluating candidate projects for incorporation into the Plan.

Finally, this section identifies all of the projects and programs that have been or are being implemented in the Region. These are grouped according to the RMSs.

This Section forms a basis for analyzing the all candidate projects to be incorporated into the Plan.

4.1 Strategies Mandated by IRWM Program Guidelines. IRWM Program Guidelines (2009) identify nearly thirty water management strategies, as part of the California Water Plan Update, 2009 that describe potential strategies for managing water resources. Others may also be considered. The Stakeholders reviewed the entire range of RMSs and developed the following approach for selecting applicable RMSs for the Region.

4.2 Identification and Integration Approach. A two-step process was used to identify groups of strategies that work together to mutually support Plan objectives and provide additional environmental, water resource management or other benefits.

Step 1: Identify Primary Water Management Strategies that Directly Address Plan Objectives.

In this step, The Stakeholders Committee reviewed and discussed potential Regional Management Strategies (RMS), which should be considered and would provide the best support for the development of the IRWM Plan. The following RMSs were selected through a consensus process. RMSs and their strategy content are shown and defined in the Table 4-1.

Table 4-1 Regional Managements Strategies

Table 4-1 is continued on next two pages

(Number in brackets refers to Chapter number in CWP 2009 and are not in order of importance)

Agricultural Water Use Efficiency (#2) Increasing water use efficiency and achieving reductions in the amount of water used for agricultural irrigation. Includes incentives, public education, and other efficiency-enhancing programs.
Urban Water Use Efficiency (#3) Increasing water use efficiency by achieving reductions in the amount of water used for municipal, commercial, industrial, irrigation, and aesthetic purposes. Includes incentives,

public education, and other efficiency-enhancing programs.

Conveyance Regional/Local (#5)
The development of new conveyance systems that could provide supplemental water supplies to the region.

Watershed Management (#7)
Comprehensive management, protection, and enhancement of groundwater and surface waters, natural resources, and habitat

Conjunctive Management Groundwater (#8)
Using and managing groundwater supplies to ensure sustainable groundwater yields while maintaining groundwater-dependent beneficial uses, including coordinating management of groundwater and surface water supplies (conjunctive use)

Desalination (#9)
Developing potable water supplies through desalination of brackish groundwater and perched water. Includes disposal of waste brine.

Surface Storage – Local and Regional (#13)
Developing additional yield through construction or modification (enlargement) of local surface detention basins or developing groundwater storage capabilities in out-of-region reservoirs.

Pollution Prevention (#17)
Strategies that prevent pollution, including public education, efforts to identify and control pollutant contributing activities, and regulation of pollution causing activities. Includes identifying, reducing, controlling, and managing pollutant loads from non-point sources.

Agricultural Lands Stewardship (#20)
Includes strategies for promoting continued agricultural use of lands (e.g. agricultural preserves), strategies to reduce pollutants from agricultural lands, and strategies create wildlife habitat within agricultural lands. Stewardship strategies for agricultural lands include erosion reduction measures, invasive species removal, and conservation by mulching.

Economic Incentives (#21)
Includes economic incentives (e.g. loans, grants, water pricing) to promote resource preservation or enhancement.

Ecosystem Restoration (#22)
Strategies that restore impacted or impaired ecosystems, and may include invasive species removal, land acquisition, water quality protection, revegetation, habitat protection and improvement, habitat management and species monitoring.

Forest Management (#23)
The active management of lands to eliminate invasive species that consume water in excess of

native vegetation and can cause impairment of storm flows.

Land Use Planning & Management (#24)
Includes land use controls to manage, minimize, or control activities that may negatively affect the quality and availability of groundwater waters, natural resources, or endangered or threatened species.

Water-dependent Recreation (#26)
Enhancing and protecting water-dependent recreational opportunities and public access to recreational lands.

Water Transfers (#27)
Contracting to provide new outside sources of imported water to the Region, potentially State Water Project and Colorado River supplies or supplies from groundwater basins or perched water tables.

Flood Risk Management (#28)
Strategies that decrease the potential for flood-related damage to property or life including control or management of floodplain lands or physical projects to control runoff.

Step 2: Develop Integrated RMSs Groupings for Each Objective. The strategies that best address each objective were then identified and integrated with other compatible strategies to achieve each objective. The Stakeholders also prioritized the objectives. The following table represents the results of a consensus process to identify and integrate the most important RMSs for the Plan.

Table 4-2
Integration of RMSs and Prioritization of Objectives

Priority Strategies	Objectives (Section 3)	Integration of Regional Management
1	Reduce Water Demand	Agricultural Water Use Efficiency Urban Water Use Efficiency
1	Increase Water Supply	Conjunctive Groundwater Storage Desalination - Brackish Surface Storage – Local/Regional
2	Practice Resource Stewardship	Agricultural Lands Stewardship Economic Incentives Ecosystem Restoration Forest Management Land Use Planning & Management Water-dependent Recreation Watershed Management

3	Improve Operational Efficiency & Transfers	Water Transfers Conveyance - Regional/Local
4	Improve Water Quality	Pollution Prevention
5	Improve Flood Management	Flood Risk Management

The resulting integrated strategy groups were then used as a guide for developing and prioritizing integrated groups of projects that achieve the Plan objectives. Plan candidate projects are identified and analyzed in Section 5.0.

4.3 Current Application of Water Management Strategies in the Region. In addition to incorporating strategies addressed in existing water management plans, this Plan builds on existing and ongoing water management efforts within the Region. Existing water management efforts within the Region are summarized below for the applicable water management strategy addressed in the *California Water Plan Update 2009*. The listing is organized by CWP Update RMS, with numbering indicating the chapter number that the RMS is described.

4.31 Conjunctive Management Groundwater (#8)

Groundwater Management Plan
The BWD adopted a AB 3030 Groundwater Management Plan in 2002. The objective of the plan is to halt and/or mitigate the rate of the increase in the overdraft of the aquifer. The GWMP identified several approaches to mitigation, including, reducing unregulated water use in the agricultural areas overlying the aquifer. The following programs are in concert with the GWMP objectives.

Construction of Monitoring Wells
Recognizing the data collected on the characterization of the groundwater basin was obtained solely from well completion reports, the BWD proposed to construct several professionally logged monitoring wells in various parts of the basin. The District was successful in obtaining grant funding and constructing four monitoring wells in 2003 and 2005. Information from these wells, which were professional logged by DWR staff, has increased the knowledge and understanding of the basin.

Defining the Reliability of Groundwater Supply by an Expert Panel
The amount of useable groundwater in storage was not well defined and therefore the amount of time available for implementing new water supply projects was unknown. Consequently, an Expert Panel was convened to address this issue. Panel participants were chosen based on their knowledge of the Borrego Valley Groundwater Basin and their familiarity with groundwater basin investigation techniques. The expert panel was charged with developing an investigation program to include a prioritized list of investigative procedures/tools and their approximate costs that would define, with

reasonable accuracy, this issue. The panel was convened at a one day workshop on December, 2007 in San Diego. Several significant conclusions were derived from the workshop and are shown below.

- There is no single investigative technique that can provide an answer to the question concerning the so called 'life' of the Borrego aquifer system.
- The most important tool in assessing this question is a numeric model of the groundwater basin.
- Depth dependent data in the basin is important in assessing the future conditions in the basin as water levels continue to fall changes in groundwater quality may occur.
- A Data Management System to house all groundwater data would greatly assist in analysis and investigations of the basin.

The BWD has pursued several actions in response to these conclusions.

Numeric Model Development

The USGS performed an investigation of the hydrology of the Borrego area and constructed a simplified numeric model of the groundwater basin with data up to the year 1980. The model was not used to estimate future conditions in the basin.

The Master's Thesis program at San Diego State University, produced two thesis' in 2002 directly related to the Borrego Valley Groundwater Basin; one on the hydrology and water resources of the Borrego Valley and the other on a numeric model of the groundwater basin. The effort included bringing up to date the hydrology information in the prior USGS model to include the 1980-2000 period; to analyzing and comparing all well data developed since 1980; modifying the conceptual hydrogeologic structure of the basin and to constructing a numeric model using today's standard software. Recognizing the substantial research, analysis and data collection involved in these efforts, BWD purchased the rights to the data and model for possible use in estimating future conditions.

BWD has contracted with the US Geological Survey to develop a working numeric model of the basin using as much as possible the basic data developed in the Master's Thesis' process previous mentioned. The USGS is currently in the second year of a three year program. Their approach has been to update their prior working model with the thesis data and operate the model to identify any areas of possible deficiency. Their next step was to translate the older model into today's standard software, modify the hydrogeologic characteristics of the basin, as now defined by the thesis data and operate the model to estimate future impacts on the basin from various development and extraction scenarios. The completed model will also be useful in defining impacts to establishing future alternative water management strategies for the basin.

Findings to date indicate that the upper most aquifer, which is the main producing aquifer, has about 50 years of remaining life.

Geographical Information System

BWD has recently contracted for the development of a GIS system or data base, as recommended by the Expert Panel. The system will incorporate all data (water level, water quality, etc.), reports and maps (groundwater contours, land use, etc.) concerning the groundwater basin and water usage (extractions, recharge, etc.). The system will be

important in providing the necessary data for the numeric model but also in performing studies and investigations in the Valley.

Depth Dependent Aquifer Data

As indicated, the Expert Panel raised a concern about the possible 'upwelling' of poor quality water from the deepest aquifer as water levels fall (due to continued overdraft). Thus the panel suggested the construction of a 'nested' (four small diameter wells immediately adjacent to each other) monitoring wells that could provide data on potential water level differences in aquifers and water quality differences and changes in the future.

In December of 2007, BWD submitted a proposal to DWR for grant funding to construct the nested monitoring well but the proposal was not accepted. BWD is searching other funding opportunities to construct the monitoring well.

DWR Local Assistance Program

In 2004, the Southern District of DWR initiated an effort to assist BWD with its groundwater assessment. Until that year and while there had been annual water level measurements taken at a network of wells for the construction of well hydrographs, no agency or investigator had analyzed the collected data or prepared contour maps of the water surface in the groundwater basin since 1980. DWR constructed groundwater elevation maps for several years and, after a review of the many well completion (driller's logs) reports, defined the water holding characteristics (specific yield) of the upper aquifer units in the basin and subsequently estimated the changes in groundwater storage for several periods (see Chapter 3).

More recently, the DWR has performed a well inventory and to obtain and analyze water quality from pumping wells. This work is coordinated with, and utilized by the investigation (numeric model, groundwater study) to be performed by the USGS.

Groundwater Preservation Fee

By resolution, the BWD implemented a groundwater mitigation program that works in conjunction with the recently adopted County of San Diego's development policy in the Borrego Valley as described in Chapter X of this plan. The county policy requires all new developments to be reviewed for adverse impacts on the Borrego groundwater basin. The new projects must demonstrate that the proposed water demands are off-set by an equal water demand reduction or additional water supply. The BWD has implemented a similar requirement that requires an additional off-setting reduction or new supply. Thus, all new development in Borrego must now retire existing demands on a 2:1 basis. One-half of this mitigation can, in some cases, be accomplished through the payment of a mitigation fee, as explained in the following:

The BWD will accept an in-lieu payment for the required reduction in demand. Mitigation fees derived from this fee can be used to fund various overdraft mitigation programs. These could include: the purchase of agricultural land for fallowing, construction of artificial recharge basins for capturing storm events, development of groundwater extraction and conveyance systems to convey water to Borrego from nearby areas and for purchasing supplement water supplies and the constructing a pipeline to

convey them into the Borrego Valley area. This fee may need to be adjusted to reflect future costs.

4.32 Agricultural Water Use Efficiency (#2)

Fallowing Policy

As indicated, the BWD desires to decrease the draw on the aquifer underlying the Borrego Valley by encouraging the permanent fallowing of actively irrigated farmland. This policy seeks to implement this approach to mitigation. The proposed policy is for property owners seeking to fallow actively irrigated farmland while maintaining their ability to rely on such fallowing as mitigation for future development within the Borrego Valley

Historically, some property owners have refrained from fallowing farmland because the policies of the District and the County were not coordinated and because existing policies only recognized fallowing that occurred within the preceding 5 years as mitigation for new development. Therefore, owners who might desire to fallow their farmland may continue to water crops (sometimes without ever intending to or actually harvesting those crops) in order to preserve their ability to use the farmland for mitigation of future development. The Fallowing Policy seeks to encourage immediate fallowing while allowing property owners to hold and transfer "Mitigation Entitlement Certificates" that may be used to mitigate the groundwater impacts of future development and is designed to encourage immediate fallowing of farmland by allowing (1) fallowing of actively irrigated farmland in exchange for durable mitigation entitlements issued by the District, and (2) providing a mechanism to control, enforce and monitor the fallowing and entitlement issuance and/or transfer.

Purchase of Water Easements on Agricultural Lands

Under this program, the BWD purchases a water easement over existing agricultural lands. While the land can still be used for non-water uses, the purchased easement effectively retires the agricultural or other high water use on the property. Recent purchases by BWD have averaged about $4,700 per afy of retired water.

It is projected that the value of these retired "water credits" could escalate to $10,000 per afy (equal to approximately $40,000 per acre given the water application rates for citrus), thus providing a powerful economic incentive for farmers to consider fallowing their active agricultural properties. However, the associated economic costs of losing this commercial base, as well as the impacts on the farming families and workers must also be a part of the analysis of this program, particularly in light of the fact that fallowing all of the agricultural land will not solve the overdraft problem in the area.

4.33 Ecosystem Restoration (#22)

Tamarisk Removal

Tamarisk is an aggressive, woody invasive plant species that has been planted as a windbreak along many roadways in the agricultural area of the Borrego Valley. Tamarisk is a facultative phreatophyte that has the ability to draw water from groundwater but once established it can survive without access to groundwater (Mojave

Weed Management Program, 2009). It is reported to consume large quantities of water, thus its removal would be of benefit the water resources of the area.

The BWD has recognized this value and has provided 'water credits' for its removal as part of its Water Mitigation and Entitlement Policy (BWD, 2009).

4.34 Surface Storage – Local/Regional/ (#13)

Artificial Recharge

The Department of Water Resources (1984) conducted a brief study of constructing artificial recharge facilities to capture and recharge storm waters emanating for the Peninsular Range on the west side of the basin. The report proposed the construction of shallow dike systems that would intercept the storm flows from the steep canyons and spreading the water over a large area behind the dikes, thus allowing the waters to infiltrate. As the dikes filled and overflowed, downstream dikes would capture the overflow and provide an opportunity for the water to infiltrate. Dike systems were envisioned at the terminus of the Tub, Hellhole, Borrego Palm, Henderson and Coyote canyons. DWR estimated that an additional 300-500 afy might be expected through catchment basins in exceptionally wet years.

Eleven catchment dikes were subsequently constructed. Their conditions were observed in 2000 as noted in the BWD Groundwater Management Plan. These catchment basins were rapidly filled with sediment after storm events and were unable to capture water.

More recently a planned residential development, known as the Viking Ranch, near the Coyote Creek has proposed to incorporate channels within the development recharging diverted Coyote Creek storm waters. The project is under consideration.

In 2006, the De Anza Country Club excavated a storm water detention basin located immediately up-stream of their development. The basin was originally constructed to protect the development from flood flows from the Borrego Palm Canyon Creek. Since its construction, however, the basin had become filled with sediment and no longer provided flood protection. Storm flows in 2005 caused significant damage to the De Anza properties. The BWD is interested in investigating the potential for a cooperative use of the basin as both a flood retarding and a water conservation basin.

4.35 Urban Water Use Efficiency (#3)

Conservation Management Program (Tiered Water Rates)

BWD has developed a 'tiered' water rate structure. (A tiered rate structure is considered a 'demand management' program.) The process included a citizen committee and two BWD directors. In January of 2008, the BWD board unanimously decided to publish notification of their intent to adopt the committees' proposed rate structure as might be modified by subsequent public hearings. In June of 2008, the BWD formally adopted a tiered rate structure that incorporated the comments and suggestions of many of its rate payers.

The program works as follows: For customers whose monthly water use exceeds a baseline of 35 hundred cubic feet (hcf) in the winter and 45 hcf in the summer must reduce their usage based on their prior 4-year average of water use, by 10% below this

average for the subsequent month or be billed at rates that are 50% higher than rates that would have applied if had they not exceeded the historic average usage for their usage above the afore mentioned baselines..

The tiered rate structure is designed to encourage water conservation and penalize wasteful water use. The proposed structure provides a rate reduction for potentially 40% of the BWD customers who are presently using excessive levels of water, and are incentivized to reduce their usage through landscape changes, fixture upgrades, and irrigation audits and improved outdoor water application strategies.

The rate structure allows more water use in the summer period as compared to the winter period of use. Funds received from the higher tiers of water use would be earmarked for a rebate program to encourage customers to purchase water conserving devices such as low flow toilets, washing machines or water-efficient irrigation systems.

4.36 Agricultural Water Use Efficiency (#2)

Installation of a California Irrigation Management Information System (CIMIS) in Borrego Valley

The BWD, in cooperation with the California Department of Water Resources (DWR) has established a CIMIS (California Irrigation Management Information System) station in the Borrego Valley. Since weather conditions in the Colorado River Desert Region are quite variable and the nearest CIMIS station to Borrego is located in Indio, CA, a local station provides the growers with better information to manage their water application rates. The station was completed in early 2008.

The DWR, in conjunction with the BWD, has held a series of seminars in 2008, in conjunction with the BWD, to inform farmers, golf course personnel and local landscape contractors how to utilize CIMIS data. The seminar includes the topic of alternative low water use crops such as jojoba, guayule, agave, and others.

Irrigation Reduction by Mulching

A pilot program was initiated by Seley Ranches to evaluate the benefits in terms of reduced water delivery from the application of heavy mulch in a citrus grove. A test area and an adjacent area were selected based on similarities in soil types, irrigation techniques and the ability to measure application rates. The pilot test was conducted over two growing seasons. The conclusion from the test was that mulching in a mature grapefruit grove allowed for a 15-16% reduction in irrigation applications. It was estimated that the savings would probably be higher in immature groves because immature groves are subject to more surface evaporation due to sun and wind exposure. It was further estimated that if a 15% reduction in delivered water due to mulching could be achieved for all agricultural in the Valley, that a savings of about a 1,500 - 2,000 afy could be realized (Smiley, 2003).

4.37 Recycled Municipal Water (#11)

Water Recycling

Water recycling has been proposed for the irrigation of the golf course, formally known as Rams Hill Golf Course. The irrigation system was constructed as a separate water system from the domestic system. Also, the wastewater treatment facility serving the planned development was designed to produce an effluent to meet CA Department of Public Health Services requirements for landscape irrigation. Unfortunately, current sewage flows into the treatment plant been insufficient to provide a supply for the golf course and are primarily lost to evaporation.

BWD has applied for grant funding under Prop 50 to conduct a feasibility study for connecting all residences to a central collection and conveyance system to the treatment plant.

Section 5.0 Project Review Process

Section Overview: This section describes the procedure for obtaining projects from the Stakeholders. It also describes an evaluation process in which all of the candidate projects (CPs) were subjected in order to categorize the projects in priority tiers, based on priorities previously established. The highest priority projects were then put through a screening model to further divide those into short and longer term implementation projects. Finallly, the candidate projects were evaluated with additional considerations from the Guidelines.

5.1 Candidate Project Identification

Candidate projects for implementation were identified in the following manner. First, the BWD had prepared an Integrated Water Management Report (2009) which contained a prioritized list of projects and programs to manage the groundwater resources in the Borrego Valley. These were presented to the Stakeholders committee.

Next, a call was made to other participating members of the Stakeholders Committee to suggest projects. Canbrake CWD provided a list of needed projects that had been prepared for a USDA funding application. Later, the Park provided a list of needed projects for their facilities. Majestic Pines CSD indicated that their needs were being taken care of through the USDA Water and Wastewater Program. Jacumba, which had been granted 'Colonia' status, indicated that their needs were already being met through Colonia funding. The tribes in the region were also contacted but declined to submit candidate projects.

The list of the candidate projects is shown below. Projects are identified by CP # and a short title description that includes the area of the Region where the project is applicable, e.g., (BV) stands for Borrego Valley; (Canbrake) for Canebrake; (Region) for Region: (Park) for AB Desert State Park and (Tribes) for tribal entities. As this point, no candidate projects have been submitted by the tribal entities.

A detailed description is included in Appendix A.

Number	Descriptive Name (Geographical Area)
1	Soil Erosion from Fallowing (BV)
2	Soil Stabilization of the Borrego Sink (BV)
3	Wetlands/Habitat Restoration/Enhancement Projects (Region)
4	Water Quality Depth Dependent Data (BV)
5	Hydrological Investigation (Canebrake)
6	Development of a Numeric Model of the Borrego Aquifer (BV)
7	Water Quality in the Agricultural Area (BV)
8	Groundwater Resources Investigation in the Northern area of Clark Lake (BV)
9	Purchase of Water Easements (BV)
10	Allegretti Farms Groundwater Basin (BV)
11	Dr. Nel Property (BV)
12	Imperial Irrigation District Project and Potential Water Banking (BV)
13	Recharge Basins (BV)

14 Mulching for Water Conservation (BV)
15 Tamarisk Removal (BV)
16 Education Outreach on Pollution Prevention, Conservation and Wellness (Region)
17 Water System Improvement (Canebrake)
18 Small Water System Water Quality Testing (Region)
19 Gauging Monitory System (Region)
20 Replacement Wells at Campgrounds (Park)

5.2 Prioritization of Candidate Projects

While all of these projects are considered to be important to effectively manage water resources in the Region, a prioritization process was established to help manage the project list and to determine which projects best meet Regional needs. As indicated in Section 4.0, the Stakeholders selected and prioritized the most important water management objectives in the Region and associated RMS (Table 4-1).

The prioritization process proceeded through the use of a matrix that displayed each of the candidate projects and the associated RMS. Table 5-1 shows each of the candidate projects (by number and a short descriptive title) and RMSs that are associated with that project. Candidate projects meeting only one RMS were eliminated from the prioritization process as they do not conform to the required integration process.

Table 5-1

Regional Management Strategies Associated with Each CP

Priortized RMs for Regions from Table 4-2 →	1					2							3		4	5
Regional RMS CWP Update 2009 Chapt. No. →	2	3	8	9	13	20	21	22	23	24	26	27	5	7	17	28
CP No. ↓ / Regional Management Strategies → / Candidate Projects ↓	Agricultural Water Use Efficiency	Urban Water Use Efficiency	Groundwater Mgt./Conjunctive Use	Desalination Brackish Water	Storage- Local/Regional	Agricultural Lands Stewardship	Economic Incentives	Ecosystem Restoration	Forest Management	Land Use Planning & Management	Recreation and Public Access	Watershed Management	Conveyance - Regional/Local	Water Transfers	Groundwater Protection	Flood Risk Management
1	Soil Erosion Fallowing - BV						X		O	X	X		O				
2	Soil Stabilization-Borrego Sink - BV								X	O			X				
3	Habitat Restorization - Region							O	X	O	O	O	X				X
4	Depth Dependent Water Quality Data - BV			X		O		O	O		O					X	
5	Hydrological Investigation-Canebrake			X				O			O						
6	Numeric Model Development - BV		O	X		X		O			O					X	
7	Water Quality in Agricultural Area - BV	O		X			O									X	
8	Clark Lake Groundwater Investigation - BV			X							O			X			
9	Water Easement Purchases - BV	X		O			X	X			X					O	
10	Allegretti Farms Groundwater Invest. - BV			X	O						O			X	X		
11	Dr. Nel - BV			X							O			X	X		
12	IID and Water Banking - BV			X	O	O		O	O		O			X	X		
13	Recharge Basins - BV			O		X		O			O	X	O				X
14	Mulching for Water Conservation - BV	X					X	O									
15	Tamarisk Removal - Region	O					O		X	X			X				X
16	Educational Out Reach - Region	O	O				O	O			O		O			X	
17	Water System Improvement - Canbrake		X					O			O			X			
18	Water Quality Well Testing (Region)			X												X	
19	Gauging Station Monitorng System (Region)															O	X
20	Replacement Wells at Campgrounds (Park)			X													

Note: X's and O's are equivalent. X's were assigned in the original evaluation, while O's were assigned in a subsequent evaluation.

5.3 Tier 1 Candidate Projects.

As indicated in Section 4.0, the highest ranked Objectives were Reduce Water Demand and Increase Water Supply. These Objectives were associated with the RMSs of Agricultural Water Use Efficiency, Urban Water Use Efficiency, Conjunctive Groundwater Storage, Desalination and Surface Storage- Regional/Local. Based on meeting these priority objectives and associated RMSs as shown in table 5-1, the following projects were assessed as Tier 1 or highest priority:

CP Number Project Title

4 Water Quality Depth Dependent Data (BV)
5 Hydrological Investigation (Canebrake)
6 Development of a Numeric Model of the Borrego Aquifer (BV)
7 Water Quality in the Agricultural Area (BV)
8 Groundwater Resources Investigation in the Northern area of Clark Lake (BV)
9 Purchase of Water Easements (BV)
10 Allegretti Farms Groundwater Basin (BV)
11 Dr. Nel Property (BV)
12 Imperial Irrigation District Project and Potential Water Banking (BV)
13 Recharge Basins (BV)
14 Mulching for Water Conservation (BV)
15 Tamarisk Removal (BV)
16 Education Outreach on Pollution Prevention, Conservation and Wellness (Region)
17 Water System Improvement (Canebrake)
18 Small Water System Water Quality Testing (Region)
20 Replacement Wells at Campgrounds (Park)

5.4 Screening of Tier 1 Projects

It was recognized that some of the projects could be implemented in the near term while others were hampered by the need for additional data and other issues that would take time to obtain or resolve. Consequently, a screening model was developed to identify the short and the longer-term projects. The model utilizes three evaluation criteria: Institutional Difficulty, Regulatory Difficulty, and Additional Hydrogeologic Data Needed. These are explained in more detail in the following paragraphs. An evaluation matrix (Table 5-2) was used to distinguish between those projects that could be implemented in the short-term and those that would require a longer time to implement, for reasons described in the following.

Institutional Difficulty: There are several issues that would require careful and lengthy negotiations. Several examples are sited here.

Since the Borrego water using community is completely surrounded by the Anza Borrego State Park, importation of water must traverse the park. It is expected that there would be difficulty in traversing the park lands due to potential disturbance of the fragile desert environment. Pipelines could be situated within existing rights-of-way for highways or electrical transmission corridors to minimize environmental disturbance. Construction in highway easements would require approvals from State transportation agencies. This process could be cumbersome and lengthy.

Importation of water from distant sources, such as the State Water Project or the Colorado River Project will require working with the governing jurisdictions in order to overcome statutory restrictions on deliveries outside the project designated member boundaries. Further, certain Counties have adopted ordnances that prohibit the export of groundwater outside of the County boundary.

Regulatory Constraints: Importation of water into the Borrego Valley will also be subject to the regulations of the Regional Water Quality Control Board of the Colorado River Basin. While Regional Boards in other areas have established limitations on the quality of the water that may be recharged or discharged into the groundwater basins, the local board has not, but recharge of non-local water or wastewaters with salinity concentrations exceeding primary

drinking water standards or ambient water quality would probably be unacceptable to the regulators.

Additional Hydrogeologic Data Needed: Some projects, especially those that propose to recharge water into the BV groundwater basin, require additional hydrogeologic information than currently exists. Data needs include a verified numeric groundwater model, water quality data a various depths of the aquifer system, and water quality information for the most intensively used portion of the basin. This criterion applies only to the candidate projects in the Borrego Valley. The evaluation matrix or screen model is show below in Table 5-2.

Table 5-2

Evaluation Matrix for Tier 1 Candidate Projects

		Criteria		
Project Number	Candidate Projects/Geographical Area	Institutional Difficulty	Regulatory Difficulty	Add'l Hydrogeologic Data Needed
9	Purchase of Water Easements (BV)	NA	None	None
14	Mulching for Water Conservation (BV)	NA	None	None
19	Back-up Wells, Storage and Pipeline Replacement (Canebrake)	NA	None	None
6	Development of a Numeric Model of the Borrego Aquifer (BV)	NA	None	None
4	Water Quality Depth Dependent Data (BV)	NA	None	None
5	Hydrological Investigation (Canebrake)	NA	None	NA
7	Water Quality in the Agricultural Area (BV)	NA	None	None
8	Groundwater Resources Investigation in the Northern area of Clark Lake (BV)	NA	None	NA
10	Allegretti Farms Groundwater Basin (BV)	Yes	Yes	Yes
11	Dr. Nel Property (BV)	Yes	Yes	Yes
12	Imperial Irrigation District Project and Potential Water Banking (BV)	Yes	Yes	Yes
13	Recharge Basins (BV)	NA	None	None

The result of this screening process, as shown in Table 5-2, is that four projects (10, 11, 12 & 13) are encumbered with Institutional and Regulatory Difficulties and can be implemented only after additional data, such as the numeric model, are available and the institutional and regulatory issues have been addressed. Consequently, the remaining candidate projects in the table can be implemented in the short-term. Thus, the short-term Tier 1 projects are:

CP Number	Project Descriptive Title
4	Water Quality Depth Dependent Data (BV)
5	Hydrological Investigation (Canebrake)

6 Development of a Numeric Model of the Borrego Aquifer (BV)
7 Water Quality in the Agricultural Area (BV)
8 Groundwater Resources Investigation - Northern area of Clark Lake (BV)
9 Purchase of Water Easements (BV)
14 Mulching for Water Conservation (BV)
15 Tamarisk Removal (BV)
16 Education Outreach (Region)
17 Water System Improvement (Canebrake)
18 Small Water System Water Quality Testing (Region)
20 Replacement Wells at Campgrounds (Park)

The longer-term Tier 1 Projects are shown below with a brief statement concerning the issues that must be resolved before the projects can be implemented:

CP Number	Project Title	Issue
10	Allegretti Farms Groundwater Basin (BV)	Crossing Park lands; groundwater export from Imperial County
11	Dr. Nel Property (BV)	Crossing Park lands; poor groundwater production rates
12	Imperial Irrigation District Project and Potential Water Banking (BV)	Crossing Park lands; export of water from another county
13	Recharge Basis (BV)	Conflict with Flood Control; agreements to periodically clean basin

Additional Considerations: A further screening of Tier 1 projects was conducted based on a number of review factors shown in the Guidelines. The results of the screening are shown in Table 5-3 located at the end of this Section. These include:

- Does the project contribute to IRWM Plan Objectives and RMSs? All of the candidate projects contribute to both the Plan objectives and RMSs as shown in Table 5-1.
- Are the projects technically feasible? Based on engineering judgment and past experience, all projects were found to be technically feasible (see Table 5-3)
- Are there specific benefits to the DACs? Yes, all projects that relate to the Borrego DAC provide benefits to that community. These projects are identified with (BV) following the project description.
- Are there specific benefits to the Native American tribal communities: The tribal communities in the Region declined to participate in the IRWM process.
- Are there environmental justice considerations? About 1/3 of the permanent population of the Borrego Valley are Hispanic in origin (2000 Census). Projects that benefit the Borrego DAC provide a positive economic for the Hispanic population of the community.
- What are the projects costs and financing opportunities? The project costs and financing opportunities, where known, are identified in Table 5-3.
- Project Status-readiness to proceed? (See Table 5-3)
- Impact on Climate Change? (See Table 5-3)
- Impact on Green House Gas emissions? (See Table 5-)

- Economic feasibility? An analysis is shown below and is based on the well know fact that the basin is in a sever overdraft situation. Further, the US Geological Survey as projected that the Borrego Valley's main producing aquifer will be rendered unuseful in about 50 years.

Economic Feasibility for Projects in the Borrego Valley: What are the economic consequences should the overdraft correction reduce the extractions from the aquifer to about 20% of today's in 50 years?

- Currently the Assessed Valuations (June 30, 2006) of the Borrego Valley is about $470,000,000
- The approximate annual tax revenue to the County (at 1%) is therefore about $4,700,000/year.
- It is estimated value of the agricultural products produced in the Borrego area for the year 2007 amounted to about $18,000,000

Since the local water resources are being exceeded by nearly 500% and if the groundwater basin were to be 'emptied', then the local economy would be reduced to about 20% of today's values. This would create a severe hardship on the residents and a substantial reduction in the assessed value of the land and structures of the area

If we assume an 80% reduction in these economic values in future year 50, then the resultant loss in values would be as follows:

Reduced AV value	$376,000,000
Reduced Tax revenue to the County	$3,760,000
Reduced Economic Value of Agricultural Products	$14,400,000

If we do not consider the annual losses between now and 50 years into the future, the Present Value of the loss in year 50 expressed in today's dollars would be about $35,000,000. This analysis discounts the annual loss in these values as the area's water supply is reduced annually.

Four of the Tier 1 Short Term candidate projects are physical projects that require construction or water easement purchase expenditures. These are shown below and include the approximate total cost of the project:

Number	Project Descriptive Title
4	Water Quality Depth Dependent Data (BV) @ $290,000
6	Development of a Numeric Model of the Borrego Aquifer (BV) - Last year funding of $500,000
8	Groundwater Resources Investigation - Northern area of Clark Lake (BV) @ $644,000
9	Purchase of Water Easements (BV) at $4,500/ac x 100 ac = $450,000

All of these projects serve to extend the life of the aquifer. The total cost of the first three projects is about $1.4 million and including the last project purchase of 100ac of water easements, the benefits are roughly 19 times greater than the costs. Thus, all of the Borrego Tier 1 projects meet the economic feasibility test.

Economic Feasibility for Projects in Canebrake: Two Tier 1 projects are for the Canebrake area: Hydrological Investigation and Water System Improvement.

The first project is economically justified in that the proposed hydrologic study to locate a second well would cost substantially less than drilling a well and discovering that the well was 'dry' or have less than needed water production.

The second project is economically justified in that the existing water system is inadequate in providing sufficient storage to protect the homes form fire. This is especially true if the transmission line, which is in need of replacement, were to fail during a fire event. Thus, the justification is based on health and safety of the small community.

Economic Feasibility for Projects in Park and Region: The three projects designated for these areas are also justified for Health and Safety reasons.

Tier 2 Candidate Projects

In accordance with the prioritization of objectives shown in Table 4-1, a second priority group of projects that fall under the objective of Practice Resource Stewardship are listed below. These projects are associated with the following RMSs:

- Agricultural Lands Stewardship
- Economic Incentives
- Ecosystem Restoration
- Forest Management
- Land Use Planning & Management
- Water-dependent Recreation
- Watershed Management

Tier 2 candidate projects under these criteria are shown below.

CP Number	Project Descriptive Title
1	Soil Erosion from Fallowing (BV)
2	Soil Stabilization of the Borrego Sink (BV)
3	Habitat Restoration/Enhancement Projects (Region)

A screening of these projects was not conducted. However, it was decided that since project 9, Purchase of Water Easements, is a Tier 1, Short-Term project, then No. 1, Soil Erosion from Fallowing (BV), should also be placed in that category.

Tier 3 Candidate Projects

The third and last category of projects includes only CP 19 Gauging Station Monitoring Systems (Region). Because of the lower priority associated with the CP and the objectives resultant RMSs, these projects are not considered for implementation in this Plan.

Summary of Implementation Projects Prioritization

As described above, the selection process developed a prioritized list of projects to be included in the Plan to be implemented. These include Tier 1 and Tier 2 projects.

Tier 1 Short-Term Implementation Projects

Number	Project Descriptive Title
1	Soil Erosion from Fallowing (BV)
4	Water Quality Depth Dependent Data (BV)
5	Hydrological Investigation (Canebrake)
6	Development of a Numeric Model of the Borrego Aquifer (BV)
7	Water Quality in the Agricultural Area (BV)
8	Groundwater Resources Investigation - Northern area of Clark Lake (BV)
9	Purchase of Water Easements (BV)
14	Mulching for Water Conservation (BV)
15	Tamarisk Removal (BV)
16	Education Outreach (Region)
17	Water System Improvement (Canebrake)
18	Small Water System Water Quality Testing (Region)
20	Replacement Wells at Campgrounds (Park)

Tier 1 Longer-Term Implementation Projects

Number	Project Descriptive Title
10	Allegretti Farms Groundwater Basin (BV)
11	Dr. Nel Property (BV)
12	Imperial Irrigation District Project and Potential Water Banking (BV)

Tier 2 Implementation Projects

Number	Project Descriptive Title
2	Soil Stabilization of the Borrego Sink (BV)
3	Wetlands/Habitat Restoration/Enhancement Projects (Region)
4	Tamarisk Removal (BV)

Table 5-3 Additional Considerations

Project No.	Description	Cost	Time	Financing (1)	Project Status	Technically Feasible	Economic Feasibility	Contribution to Climate Change	Green House Gas Impact
1	Soil Erosion Fallowing - BV	Unknown	Unknown	Unknown	None	Yes	Need C/E Study	Positive	Neutral
2	Soil Stabilization-Borrego Sink - BV	Unknown	Unknown	None	None	Yes	Need C/E Study	Neutral	Neutral
3	Habitat Restorization - Region	Unknown	Unknown	None	None	Yes	Need C/E Study	Neutral	Neutral
4	Depth Dependent Water Quality Data - BV	$290	6 mo	AB 303	Ready - USGS agreed to participate	Yes	See Text	Positive	Positive
5	Hydrological Investigation-Canebrake	$30	3 mo	None	Ready	Yes	NA	Positive	Positive
6	Numeric Model Development - BV	$600K	3 yrs	None	Ready - In 2nd year of 3 year study	Yes	See Text	Positive	Positive
7	Water Quality in Agricultural Area - BV	50K	2 months	None		Yes	NA	Positive	Neutral
8	Clark Lake Groundwater Investigation - BV	$600K	4 months	55% Grant Pending	Ready - Federal Funding pending in Congress	Yes	See Text	Neutral - Less energy than groundwater extraction in BV	Neutral
9	Water Easement Purchases - BV	$4,500/ac (5)	NA	None	Ready - On going	Yes	See Text	Positive	Positive
10	Allegretti Farms Groundwater Invest. - BV	Unknown	Unknown	None	No	Yes	Need Preliminary Investigation	Negative	Negative
11	Dr. Nel - BV	$7.3M (3)	Unknown	None	No	Yes	Need Preliminary Investigation	Negative	Negative
12	IID and Water Banking - BV	$57M (3) - $80M	Unknown	None	Ready - Bureau of Reclamation Study underway	Yes	Study by Bureau of Reclamation will determine feasibility	Negative	Negative
13	Recharge Basins - BV	Unknown	Unknown	None - Possibly Prop 1E	None	Yes	Need Preliminary Investigation	Positive	Positive
14	Mulching for Water Conservation - BV (2)	Unknown	Unknown	None	Yes	Yes	Need C/E Study	Positive	Positive
15	Tamarisk Removal - Region	Unknown	Unknown	None	None	Yes	Need C/E Study	Neutral	Neutral
16	Out Reach/Pollution, Conservation - Region	Unknown	Unknown	None	None	Yes	NA	Positive	Positive
17	Water System Improvement - Canbrake	$1.46M (4)	18mo	None	None	Yes	'No project' alternative is unacceptable	Positive	Positive
18	Gauging Station Monitoring System - Region	Unknown	Unknown	None	None	Yes	Unknown	Neutral	Neutral
19	Water Quality/Small/Private Wells - Region	Unknown	Unknown	None	None	Yes	Health and Safety	Positive	Positive
20	Replacement Wells at Campgrounds - Park	Unknown	6 Months	None	Ready	Yes	Health and Safety	Positive	Positive

Note 1.Possible Funding from other sources

Note 2. Based on study by Seeley Ranches. No cost data included in study.

Note 3. Source BWD IWRM Plan, 2009

Note 4. Source Canbrake USDA Pre Funding Application

Note 5. BWD

Section 6.0 Impact and Benefits

Overview of Section: This section of the Plan contains a description of impacts and benefits relating to the implementation of the Plan. The discussion considers both of these for the region and adjoining regions. Impacts and benefits to the DACs in the region are also discussed. Since there have not been any Environment Justice issues identified and the Native American tribal communities in the Region have declined to participate, neither is discussed.

6.1 Impacts to Region

Implementing Plan Objectives: Identified in Section 5 are the projects have been selected for implementation by this plan. Also identified and prioritized by the Stakeholders group are six objectives for the region. The following table shows how each of the Plan implementation projects implement the selected objectives.

As shown in the table 6-1, all regional objectives are being met by the plan implementation projects. Thus the region will benefit as each of the projects comes to fruition. It is noted that the highest ranked objective for the region were Reduce Water Demand and Increase Water Supply are affected by six of the eight implementation projects.

Table 6-1

Relationship Between Tier 1 Short Term Projects and Objectives

CP No.	Objectives → / Tier 1 - Short-Term Projects ↓	Reduce Water Demand	Increase Water Supply	Practive Resource Stewardship	Improve Operat'l Effeciency & Transfers	Improve Water Quality	Improve Flood Management
		Objectives					
1	Soil Erosion Fallowing - BV			✓			
4	Depth Dependent Water Quality Data - BV			✓		✓	
5	Hydrological Investigation-Canebrake	✓					
6	Numeric Model Development - BV		✓			✓	
7	Water Quality in Agricultural Area - BV		✓			✓	
8	Clark Lake Groundwater Investigation - BV		✓				
9	Water Easement Purchases - BV	✓		✓		✓	
14	Mulching for Water Conservation - BV	✓		✓			
15	Tamarisk Removal (BV)			✓			✓
16	Education Outreach (Region)		✓		✓		
17	Water System Improvement - Canbrake		✓	✓	✓		
18	Small Water System Water Quality Testing (Region)			✓		✓	
20	Replacement Wells at Campgrounds (Park)		✓		✓		

6.2 Other Benefits

The Stakeholders group also participated in an exercise directed at identifying the benefits of all projects submitted for consideration. The projects were first grouped into categories established as Statewide Priorities. These included Environmental Stewardship, Protect Groundwater Quality, Drought Preparedness (this category was further subdivided into Supply Augmentation, Water Conservation and Small Systems) and Protect Water Quality. Project benefits were identified as:

- Water Supply
- Water Quality

- Water Reliability
- Water Conservation
- Storm Water Capture
- Invasive Species Removal
- Water Banking
- Integrated Flood Management
- Watershed Management
- Regional Concept

Table 6-2 displays the benefits resulting from each of the candidate projects submitted on inclusion in the plan. The projects are grouped according to Statewide priorities. Further, the Stakeholders discussed the benefits of each project and then prioritized the projects within each Statewide priority. As indicated above, the Stakeholders further identified the benefits that would be associated with each of the candidate projects.

Not all of the candidate projects were selected for inclusion in the Plan. ~~The table further identifies the projects included for implementation in the Plan.~~

Table 6-2

Prioritized Projects and Benefits

Revised as per Subcommittee 5-25-10

Regional Issues by Statewide Priorities	Priority	Project Benefits: Water Supply	Water Quality	Water Reliability	Water Conservation	Storm Water Capture	Invasive Species	Water Banking	Integrated Flood Mgt.	Watershed Management	Regional Concept
Environmental Stewardship											
Soil Erosion from Fallowing - BV	1									✓	
Soil Stabilization of the Borrego Sink - BV	3									✓	
Wetlands/Habitat Restoration/Enhancement Projects - Region	2									✓	✓
Protect Groundwater Quality											
Water Quality Depth Dependent Data - BV	3	✓	✓	✓							
Groundwater Model of Borrego Basin by USGS - BV	1	✓		✓							
Hydrogeologic -Canebrake	2	✓		✓							
Water Quality in the Agricultural Area BV	4		✓	✓							
Drought Preparedness - Supply Augmentation											
Groundwater Investigation in Clark Lake -BV	1	✓	✓	✓							
Allegretti Farms Groundwater Basin - BV	4	✓	✓	✓				✓			
IID and Water Banking - BV	3	✓		✓				✓			
Purchase of Water Easements -BV	2	✓		✓							
Dr. Nel Property - BV	5	✓		✓							
Drought Preparedness - Water Conservation											
Tamarisk Removal - Region (Prop 1E Funding)	2				✓		✓		✓	✓	
Mulching for Water Conservation - BV	3				✓						
Recharge Basins - BV (Prop 1E Funding)	1	✓			✓	✓			✓		
Drought Preparedness - Small Systems											
Back-up Wells; Storage; Pipeline Replacement - Canebrake	1	✓	✓	✓	✓						
Testing Well Water Non-Municipal Systems - Region*	2		✓								✓
Protect Water Quality - Public Education											
Outreach Water Pollution Prevention and Conservation - Region	2		✓								✓
School Districts Wellness Program - Region	1		✓								✓

6.3 Direct Benefits to DACs

The ABD IRWM region is a series of disadvantaged communities dotting the eastern portion of unincorporated San Diego County. Only a few population centers fall in the region, the largest being Borrego Springs, followed by Jacumba, the Majestic Pines community near Julian, Canebrake, Shelter Valley and Ocotillo Wells. Most all of these areas rely on groundwater for drinking and septic systems for waste disposal, the exceptions being a small portion of Borrego Springs and all of the Majestic Pines subdivision. Many of the individual private homesteads utilize decades old water wells with very little idea of the water quality or longevity of the supply. The county of San Diego oversees the general health conditions of the water supplies but has very little budget to perform any water quality or aquifer testing in the remote East County areas.

The DAC element for the region will focus on water quality analysis and wellhead education to ensure the entire population has safe drinking water. In addition, information will be disseminated on preventing cross connection/backflow contamination of the drinking water systems to educate our neighbors on proper piping and irrigation practices.

School educational programs will also be a high priority of the IRWMP. These programs will include educating elementary school children on the dangers of drinking pooled or stagnant waters, middle school will feature programs on the hydrologic cycle and from where our water comes and high school programs will teach the young adults on water quality and sustainability. All levels will be instructed in water conservation programs and how these principles can be applied to our everyday lives.

Further education is needed with the landscape irrigators and gardeners. Many have little concept as to cross connection/backflow contamination and education on this matter is prudent for safe drinking water. Also the landscapers could utilize irrigation training on smart irrigation timers with weather station-based systems and other innovative products for more effective water delivery. These programs need to be instructed in both English and Spanish languages.

Of the four communities that deliver water supply and have agreed to participate in this Plan, Borrego and Jacumba, are economically disadvantaged. The Plan identifies significant indirect benefits to these communities. They are discussed separately for each community.

6.4 Indirect Benefits to Borrego Valley DAC

6.4.1 Reduction in Groundwater Level Decline: The chief issue in this area is the constant lowering of the groundwater levels. Annual decline levels range from 2 to 4 feet per year, with an average of about 3 feet per year. There is some indication that the rate of decline is increasing due to the 'bowl' shaped nature of the groundwater basin, however, this has not been confirmed.

This is a potential substantial impact on the DAC as groundwater pumping costs are a significant factor in determining the water rates paid by the community. For example, with current electrical rates, a 100 foot drop in groundwater levels would result in an increase pumping cost of about $15 per acre foot. Thus, implementation projects that reduce the water demand have the impact of decreasing the rate of lowering of the water table and subsequently the benefit of reducing the cost of water extraction that would otherwise occur and ultimately translate into a reduction in the amount of O&M expense required to be passed on to the DAC rate payers.

Implementation Plan projects #9 - Water Easement Purchases and #14 – Mulching for Water Conservation both have the impact of reducing water demand. Tiered water rates, an

existing program of BWD, also impacts the lowering of water levels and provides benefits to the DAC.

6.4.2 Deferring Importation Projects: Reducing water demand also serves to defer the ultimate need to import water into the Valley. The importation projects identified, with the exception of the Clark Lake Importation Project, have associated costs that far exceed the local community's ability to fund the projects. The existing community is too small and economically disadvantaged to afford these projects without substantial grant or subsidy funding from State and Federal sources. A secondary impact and benefit results from a delay in the expenditures for an importation project. A delay would allow the ratepayer or project funding base to increase so that the expenditure would be spread over a larger economic and population base.

All would require a significant State or Federal grant to provide a reduction in the rate necessary to fully fund the construction and operation of the project. These would have a substantial impact on the DACs water rates.

The impact and advantage of reducing water demand is to allow time for the community to transform its economic base from agriculture to residential. Existing policies will allow this to occur without an increase in water demand. In fact, under the BWD policy, the conversion would reduce the water demand on the basin. Also, increasing water supply, without importation, would have the same impact and benefit.

Finally, project #13 Recharge Basins has the impact of increasing water supply, but has the dual impact as Reducing Demand and Increasing Water Supply. (Reducing groundwater level decline)

6.4.3 Water Quality Protection: The protection of groundwater quality is an important benefit of several of the Plan projects. Nitrate invasion into one of BWD wells has already caused the well to be closed and a new well drilled as a replacement. Thus, poor water quality that may exist in the area intensively used for agricultural purposes or deeper groundwater of poor quality that might 'up-well', could render existing wells un-useable without treatment or abandonment and re-drilling. Both are expensive options.

If these water quality intrusions were to be realized, the significant remediation or correction expense would be passed on to the DAC rate payers. Thus, water quality projects included in the Plan would allow 'early warning' signals and mitigation programs to be implemented to prevent the occurrence.

The Implementation Plan includes the following water quality projects: #4 Depth Dependent Water Quality Data, #6 Numeric Model Development and #7 – Water Quality in Agricultural Area. These Projects implement the objective of Improve Water Quality, but also serve to prevent the loss of water supply.

6.5 Canbrake (outline only)

Also DAC

Backup system provides

Assured water supply, fire fighting supplies become sufficient. Helps decrease home owner insurance costs.

Leakage reduction… reduces OM costs, reducing rates.

Alternate supply, provides for WQ protection in event one well become tainted with poor quality water